

Biting Fly Research Project – 5 Year Project 2005-2010

“Origin, Development and Population Genetics of Stable Flies affecting Pastured and Confined Livestock”.

Scientists: David Taylor, Dennis Berkebile

Problem to be Addressed: The Cattleman’s Beef Association has indicated that stable flies are the most important arthropod pest of cattle in the United States. Changes in animal husbandry over the last 20 to 30 years have resulted in increased stable fly impact on range and pasture cattle, doubling the economic impact of this pest to nearly one billion dollars per year. Although stable fly has been considered a serious pest of livestock, humans and pets for over 100 years, the biology of this insect is poorly understood and appears to be constantly changing in response to changing manure management and feed management practices. This project will develop fundamental knowledge on the biology of stable flies in the upper Great Plains.

Objectives of Research: The objectives will address National Program 104 (Veterinary, Medical and Urban Entomology).

Objective 1 - To gain a better understanding of stable fly population dynamics by elucidating their genetic structure throughout North America. [Taylor, Szalanski (University of Arkansas), Black (Colorado State University)]

Development of genetic markers and application of population genetic analyses to understand the structure of stable fly populations and the roles of migration and genetic drift in maintaining the observed structure.

Objective 2 - To identify and characterize stable fly larval developmental sites and correlate larval production with adult population dynamics in relation to season, climatic variables and cultural practices. (Taylor, Berkebile)

- a) Identify larval developmental sites, determine the number of viable larvae produced at each site and determine the relationship of weather to stable fly development.
- b) Correlate the number of viable larvae produced at each site with adult populations to identify primary contributors to pest fly populations.

Objective 3 - To determine the relative contributions of overwintering and migration to early season colonization of stable fly populations. [Taylor, Berkebile, Broce (Kansas State University), Hogsette (Agricultural Research Service-Gainesville, Florida)]

- a) Survey and characterize stable fly overwintering habitats.
- b) Develop artificial overwintering habitats to study the environmental limits of overwintering stable flies.